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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,574	07/03/2003	Takeshi Ootsuka	P/2850-79	5446

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EXAMINER
MACARTHUR, SYLVIA

ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 05/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/613,574	OOTSUKA ET AL.	
	Examiner	Art Unit	
	Sylvia R. MacArthur	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6 and 7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6 and 7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/11/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Terminal Disclaimer

1. The terminal disclaimer filed on 2/15/2006 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 6,782,908, 2003/0071260, and 2003/0011287 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 103

2. Claims 1-3 and 6 are rejected under 35 U.S.C. 103(a) as obvious over Inazumachi et al (US 2002/0006678) in view of Yamamato et al (US 6,475,924).

Inazumachi et al teaches a susceptor and manufacturing method therfor comprising a built-in electrode type susceptor.

Re Claim 1: The apparatus comprising a susceptor base member 25 [0027] which is made of an aluminum-nitride-group-sintered-member

on one of which surface a plate sample is mounted;

an inner electrode 22 which is built in the susceptor member [0060]; and

a power supplying terminal 4, which is disposed in the susceptor base member so as to be attached to the inner electrode, wherein

the power supplying terminal is made of a conductive aluminum-nitride-tantalum-nitride-composite-sintered-member [0068].

Inazumachi et al further teaches that the alumina (aluminum oxide)-tantulum carbide composite ceramics conductor has a material containing 54-71% tantalum by weight, see section [0029].

Inazumachi further suggests that aluminum nitride-tantulum composites can be substituted for

alumina (aluminum oxide)-tantulum carbide composite ceramics conductor as those materials listed in [0027] provide optimal specific resistance for the internal electrode.

Though Inazumachi fails to teach *tantalum nitride*, TaN, during the sintering process, a portion of the tantalum (Ta) present would be converted to TaN as both elements Ta and N are present in the manufacturing atmosphere.

Furthermore, Yamamato teaches that Ta-N is favorably adhered to AlN to provide large adhesion strength and high thermal conductivity, to desired properties in manufacturing electrodes.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to produce a power supply terminal of conductive aluminum-nitride-tantalum-nitride-composite-sintered-member. Using the calculation below, it is shown that the range of tantulum nitride within the power supply terminal of Inazumachi as modified by Yamamato is within the range of 54-71%.

$$\%TaN = \frac{MW(TaN)}{\%\,Ta\ \ MW(Ta)} = \frac{14 + 180.9}{180.9} = \frac{194.9}{180.9} = \frac{x}{54}$$

x_{54} = % TaN = 58.2

x_{71} = % TaN = 76.5

Both 58.2 and 76.5 fall within the range of 50-98% of TaN of the present invention.

Re Claim 2: An electrode-built-in susceptor according to Claim 1 wherein

the susceptor base member is formed by a mounting plate which is made of a) an aluminum-nitride-group-sintered-member on one of which main surface a plate sample is mounted and a supporting plate 3 which is made of a) an aluminum-nitride-group-sintered-member which is

attached to the mounting plate unitarily, [0090]

Re Claim 3: An electrode-built-in susceptor according to Claim 1 wherein the inner electrode is made of a conductive aluminum-nitride-tantalum-nitride-composite-sintered-member or a conductive aluminum-nitride-tungsten-composite-sintered-member, see [0060].

Inazumachi et al further teaches that the alumina (aluminum oxide) tungsten conductive composite ceramics has a material containing 54-95% by weight tungsten (W), see section [0030]. Inazumachi suggests that aluminum nitride-tungsten composites can be substituted for alumina (aluminum oxide)-tungsten composite ceramics conductor as those materials listed in [0027] provide optimal specific resistance for the internal electrode.

Regarding the amount AlNTaN see the rejection of claim 1.

Regarding the amount of AlNW, Yamamato teaches that tungsten favorably adhered to AlN to provide large adhesion strength and high thermal conductivity, to desired properties in manufacturing electrodes.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to produce a power supply terminal of conductive aluminum-nitride-tungsten-composite-sintered-member. Regarding, the amount of W in the aluminum nitride tungsten composite material, this is a matter of optimization. The motivation to optimize the amount of tungsten within the composite is that tungsten is known provide a high melting point metal such as tungsten known for its enhance conductive properties. Thus, it would have been obvious to utilize aluminum nitride tungsten or aluminum nitride tantalum nitride composite sintered materials as the material of construction for the internal electrode of Inazumachi as modified by Yamamoto.

Re Claim 6: Method for manufacturing an electrode-built-in susceptor

comprising the steps of:

making a mounting plate for mounting a plate sample thereon and a supporting plate for supporting a mounting plate by an aluminum-nitride-group-sintered-member;

forming a through hole on the supporting plate;

inserting a power supplying terminal which is made of a conductive aluminum-nitride-tantalum-nitride-composite-sintered-member in the through hole so as to fix the power supplying terminal therethrough;

applying a member which contains a conductive powder on a main surface of the supporting plate such that the conductive powder contacts the power supplyng terminal;

attaching the mounting plate to the supporting plate via the member which contains the conductive powder;

heating the mounting plate and the supporting plate under a compressed-atmosphere condition so as to form an inner electrode between the supporting plate and the mounting plate unitarily, see [0077] – [0143].

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inazumachi et al in view of Yamamato as applied in claims 1-3 and 6, and further in view of Yamada et al (US 6,134,096).

The teachings of Inazumachi et al as modified by Yamamato were discussed above. The modification fails to teach a green body for the mounting plate. Yamada et al teaches preparing a green body and heating the bodies to make the mounting plate and placing the electrode inside, see col. 9 lines 7-25.The motivation to use this method in

combination of the teachings of Inazumachi et al as modified by Yamamato is that it improves mass production. Thus, it would have been obvious for one of ordinary skill at the time of the claimed invention to combine the teachings of Inazumachi et al as modified by Yamamato in view of Yamada et al.

Response to Arguments

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action. Applicant's amendment regarding the amount of tantulum nitride or tungsten in the sintered composite material to construct the terminal electrode necessitated the introduction of the prior art by Yamamoto.

5. Applicant's arguments with respect to claims 1-3, 6, and 7 have been considered but are moot in view of the new ground(s) of rejection.

The prior art by Yamamato teaches the motivation of using TaN or W in a composite with aluminum nitride to provide optimal thermal conductivity and adhesion strength.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438. The examiner can normally be reached on M-F during the core hours of 9 a.m. and 3 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sylvia R MacArthur
Patent Examiner
Art Unit 1763

April 21, 2006

PARVIZ HASSANZADEH
SUPERVISORY PATENT EXAMINER